# **GEOLOGY**

## Physiographic Region

The Lamine River Basin lies in two <u>physiographic regions</u>. Muddy Creek and Heath's Creek enter from the Osage Plains to the West while Richland Creek, Flat Creek and the mainstem Lamine River lie mainly in the Salem Plateau (MDNR 1986).

#### Geology

The <u>Lamine River Basin</u> is unglaciated and overlain by four to eight feet of derived soils. The soil overlies dolomite in the upper part of the basin and limestone in the lower part of the basin. Little water moves into the subsurface of the basin, probably due to a clayey residuum that overlies the limestone or dolomite bedrock and the presence of shale. Baseflow is not well sustained during dry periods because most water movement in the basin is through the surface stream network and few notable springs exist (MDNR 1984).

#### Soil Types

The Lamine River Basin lies primarily in the Cherokee Prairies soil region (MDNR 1986). Highly erodible loess soils are well drained in most areas but poorly drained in other areas. Sheet and rill erosion from tilled land (9-13 tons/acre) is relatively high considering an acceptable level of 2-5 tons/acre (Anderson 1980). Erosion from permanent pasture is much lower (2.5-5.0 tons/acre) as expected. Gully erosion is considered severe (200 - 500 tons/acre) in the region of the subbasin based on a statewide comparison (Anderson 1980).

#### **Watershed Characteristics**

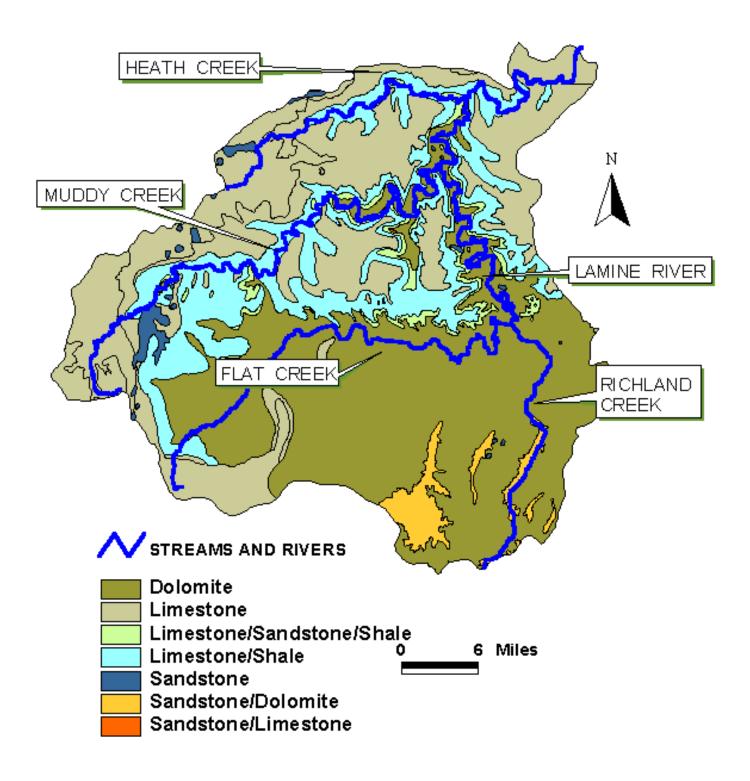
The Lamine River above its confluence with Blackwater River is a sixth order stream with an area of 1080 square miles (USDA/SCS 1981; Table 1). One other sixth order stream, Flat Creek, flows northeastward forming the Lamine River at its confluence with Richland Creek. Flat Creek has the largest watershed (400 square miles) in the Lamine River Basin. Three fifth order streams, Muddy Creek, Heaths Creek, and Richland Creek, and several fourth order streams are present in the Lamine River Basin (Table 1).

Stream ordering is a classification technique that is an indication of the relative size of a stream. This is useful but with it alone, we are not able to determine how the subject stream relates to the remainder of the stream system. For example, there are thirty-three third order streams in the Lamine River Basin but their watershed sizes vary greatly. Some are comprised of as few as four 1st order streams but watersheds of 10 - 20 1st order streams are common. One is comprised of forty 1st order streams. Likewise, the order designation does not indicate where the subject stream lies relative to the entire basin. This information is important because, within any given basin, downstream locations typically have greater species diversity and habitat complexity (Sheldon 1968 and Horwitz 1978). Thus a tributary of the lower Lamine River should be expected to have a different species assemblage than a tributary of the same order in the upper reaches of the watershed. Knowing the relative location of a stream within the basin, a concept referred to as "spatial scale", is valuable information for stream fisheries management.

#### **Channel Gradient**

Gradient information was obtained from MDC Research Section gradient computer file and/or calculated from USGS 7.5' topographic maps. Gradient plots of fourth order and larger streams were prepared (Appendix 1). Major streams (fifth order and larger) in the Lamine River Basin range in average gradient from 1.5 ft/mi (mainstem Lamine River) to 19.1 ft/mi (Little Richland Creek). Streams entering from the western portion of the watershed, including Heath's Creek, Muddy Creek and Flat Creek, have lower gradients than streams farther to the east (Richland Creek and Haw Creek). This shift in gradient reflects the transition from Prairie to Ozark border streams within the Lamine River Basin.

## Geology of the Lamine River Watershed.



# Location of the Lamine River Watershed within Missouri's Natural Divisions.

